



Cavity wall insulation:
Unlocking the potential in
existing dwellings



energy saving trust™

Introduction

Home energy use is responsible for 27 per cent of UK carbon dioxide emissions which contribute to climate change. By following the Energy Saving Trust's best practice standards, new build and refurbished housing will be more energy efficient – reducing these emissions and saving energy, money and the environment.

Who is this publication for and for what purpose?

This guide is aimed at local authorities and other social housing providers to advise on basic issues associated with cavity fill, what to look for and when and where to install it.

What is the current take-up of cavity wall insulation?

Cavity wall insulation is the single most cost-effective, low risk energy efficiency measure available for the existing housing stock, after loft insulation. It can be installed without major disruption to occupants and it needs no maintenance.

Yet only around 5 million of the 12 million homes suitable for cavity fill are reaping the benefits of cheaper fuel bills and greater comfort. This leaves some 7 million dwellings with cavity walls that could still be insulated (Cavity Insulation Guarantee Agency (CIGA) 2002) and provide householders with considerable financial and comfort benefits. At the current rate of installation – about 280,000 dwellings per annum – market saturation is many decades away. There is no technical reason why this rate could not be increased – the benefits are well established.

What are the benefits?

People who own houses with cavity wall insulation identify the following benefits:

- Reduced fuel bills.
- A warmer house that stays warmer longer.
- A cooler house in summer.
- Reduced condensation.
- Fewer draughts.
- Environmental gains.

Cavity wall insulation can reduce the heat loss through cavity walls by up to 40 per cent. Payback (savings against costs) is estimated at between 3 and 4 years. Cavity wall insulation can also lead to reduced heating costs and improved comfort levels.

But the occupant is not the only potential beneficiary. Installing cavity wall insulation in all suitable existing dwellings would benefit the environment by

substantially reducing the emission of greenhouse gases into the atmosphere. Greenhouse gases are widely accepted as causing climate change.

How does filling the cavity affect the wall?

Cavity wall construction in older housing generally consists of two leaves of masonry, an outer leaf (often of facing brickwork) and an inner leaf of brickwork or blockwork separated by a nominal 50mm wide cavity. In reality most cavities are 65mm wide (BRE report for the Energy Saving Trust concerning EEC4, 2001). The cavity was, of course, introduced originally to avoid problems of dampness experienced by older solid walled dwellings.

Some people think that filling the cavity (in effect bridging the gap between the two masonry leaves of the cavity wall) must lead to a greater risk of dampness passing from the 'wet' outer leaf to the 'dry' inner leaf. In fact, this is not the case, as has been shown by a government sponsored independent study carried out in the mid 1990s (Figure 1).

There was no evidence from the study that filling the cavity with insulation resulted in any greater incidence of damp problems than occurred in cavity walls that had not been filled with insulation.

What the study did show was that the structural condition of the walls was critical in avoiding the transfer of moisture to the inner leaf.

Any cavity wall, if not correctly built, e.g. with poorly filled mortar joints or mortar droppings on wall ties, would be likely to have problems.

Good construction and continuing maintenance, such as pointing, are key factors, therefore, in determining whether a wall is suitable for cavity insulation.



Choices and assessment

The graphs below show the improvements associated with cavity fill. There are fewer problems and less condensation and damp. Condensation and damp are most commonly associated with poor ventilation – especially to properties with filled cavities. Occupiers should be advised to maintain some form of controlled ventilation (e.g. trickle vents).

What are the choices of cavity insulation system?

The vast majority of cavity wall installations are carried out using mineral wool systems (either rock or glass mineral wool). The remaining installations use mainly systems based on expanded polystyrene beads or granules, with less than 1 per cent using urea-formaldehyde (UF) foam.

There are some concerns about the health effects of formaldehyde cavity wall insulation. Allergic skin reaction to formaldehyde is unlikely at the concentrations used for cavity fill. However, some individuals may suffer irritation to the eyes or upper respiratory tract. If in doubt seek medical advice.

Mineral wool and expanded polystyrene systems are certified by the British Board of Agrément (BBA). UF foam systems are covered by British Standards (BS 5617, BS 5618). The BBA also assesses and regularly monitors the performance of Approved Installers. Before you go ahead, ask a number of different cavity wall insulation system installers/suppliers to make an

assessment of the property to see which fill material is the most suitable for your wall construction and exposure.

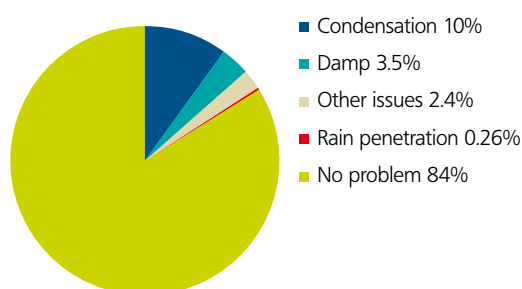
How to assess whether a house is suitable?

To ensure that cavity wall insulation is only installed where it is appropriate and to ensure that the price is accurate, the designers of each cavity wall insulation system have a strict assessment procedure.

This procedure involves:

- Determining whether the wall is in fact a masonry wall with unfilled cavities.
- Inspecting the general condition of the external wall.
- Identifying any constructional defects that first need to be remedied.
- Checking on the inside of external walls to see if there are any existing dampness problems that need to be remedied.
- Checking any penetrations of the external wall, e.g. for flues and air ventilators.
- Finding out if the cavity of a directly adjacent house has already been filled, e.g. in a terraced or semi-detached house.
- If necessary for the insulation system, checking the exposure of the wall.

Filled cavities



Unfilled cavities

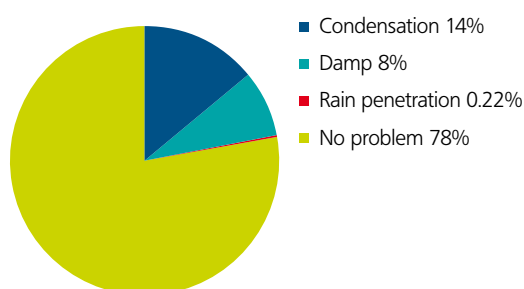


Figure 1 Analysis of dissatisfaction: only 0.26 per cent of homes with cavity filled walls suffered problems attributed to rain penetration Source: BRE CR188/93 (1993)

Wall construction/exposure

Wall construction

The standard of wall construction and its condition will be taken into account in the assessment of suitability. Defects within the wall construction such as bridged cavities, as well as other defects, e.g. failed pointing or broken guttering that causes the top of the wall to be saturated, will be picked up during the assessment and should be rectified before filling begins.

Exposure

Most mineral wool and expanded polystyrene systems are suitable for use in all parts of the UK without restriction.

However, for some systems, particularly those using UF foam, it may be necessary to check the exposure of the wall. This is carried out first by reference to national maps of exposure zones (see Figure 2), then by an assessment of local conditions. For example, the wall to be filled may be sheltered by other buildings or landscaping, or it may be on the edge of a housing estate facing the prevailing wind over open countryside. In the first example, the wall is likely to have an exposure less than is indicated for the locality on the national map and, in the second, it could have a greater exposure.

If a wall is assessed as being suitable and the installation is carried out correctly, all systems will be trouble-free and provide similar levels of insulation benefits.

What is involved in filling?

The installation usually takes less than half a day to complete. It is done entirely from the outside so it causes little disturbance compared with other forms of retro-fit wall insulation, such as insulated dry lining. The only discomfort would arise from the noise of drilling the injection holes and injecting the insulant.

The installation process involves:

- Drilling injection holes through mortar joints.
- Installing any cavity barriers to prevent the fill entering the cavities of adjacent properties.
- Sleeving (or sealing, if obsolete) air ventilators that cross the cavity.
- Injecting the fill material into the wall cavity.
- Carrying out quality checks on the fill material.
- Making good the injection holes with colour matching mortar or render.

What is the CIGA guarantee scheme?

Underpinning the work of reputable cavity wall insulation contractors is the CIGA Guarantee scheme. This is administered by the Cavity Insulation Guarantee Agency (CIGA), which was established in consultation with the government to provide householders with an independent, uniform and dependable 25 year guarantee.

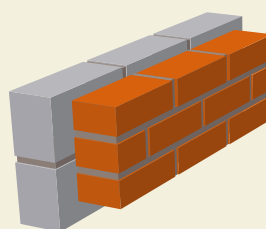
CIGA is an independent agency, managed by a committee of System Designers (the insulation material suppliers) and Approved Installers, with support from trade associations and the government.

Under the scheme, an Approved Installer is required to:

- Carry out a pre-installation assessment of the property to determine its suitability.
- Carry out the installation in accordance with approved technical requirements.
- Provide the customer with a guarantee, issued by CIGA, on completion of the contract.

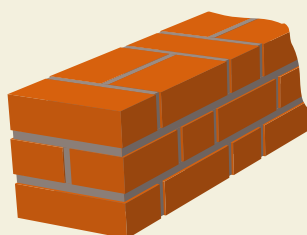
If there is a post-installation problem, the homeowner can contact the Approved Installer who will inspect and remedy the problem where possible. If the problem is unresolved, the customer can contact CIGA (see Further information for details), who will arrange for the relevant System Designer to investigate the complaint and, where necessary, carry out remedial work free of charge.

How to identify a cavity wall



Cavity walls are usually built of brickwork (for the outer leaf) and concrete blockwork (for the inner leaf). A brick cavity wall usually has all the bricks placed lengthways, and a total thickness of about 300mm. Most houses built since the 1950s have cavity walls.

How to identify a solid wall



Solid walls are mainly built of brick or stone. Some solid brick walls can be recognised by the pattern of brickwork: the bricks are placed both head-on and lengthways. The total thickness of the wall is usually about 225mm. Most pre-1930 houses have solid walls.

Conclusions

What do homeowners think?

In a government sponsored survey (BRE 17/92:1993) in the 1990s, people who lived in houses with cavity wall insulation identified the following benefits:

- Reduced fuel bills.
- A warmer house that stays warm longer.
- A cooler house in summer.
- Reduced condensation.
- Fewer draughts.
- Environmental gains.

Also, they thought that it would take longer than it does to pay for the initial outlay in fuel savings actually only 3 to 4 years. In spite of this misconception, 96 per cent of the occupiers who took part in the survey said they would install cavity wall insulation if they moved house.

Conclusions

There is considerable potential for increasing the take-up of cavity wall insulation, with resultant benefits for landlords, occupiers and the environment.

Cavity wall insulation is the most cost-effective low risk energy efficiency measure for existing housing, after loft insulation. Any cavity wall, if poorly constructed, is likely to suffer from damp problems. There is no evidence that filling with cavity wall insulation increases the risk of rain penetration. Good maintenance of the house and the correction of building defects are the keys to success.

Most cavity wall insulation systems are suitable for use in all parts of the UK without restriction. For those where exposure is an issue, assessment methods are available to ensure that the installation will perform satisfactorily.

The cavity fill installation causes little disturbance and can usually be carried out in less than half a day. It is carried out by Approved Installers whose work is backed by a dependable 25 year guarantee from the CIGA. Customer satisfaction is high – more than 95 per cent of homeowners who have cavity wall insulation would install it in a new house if they moved.

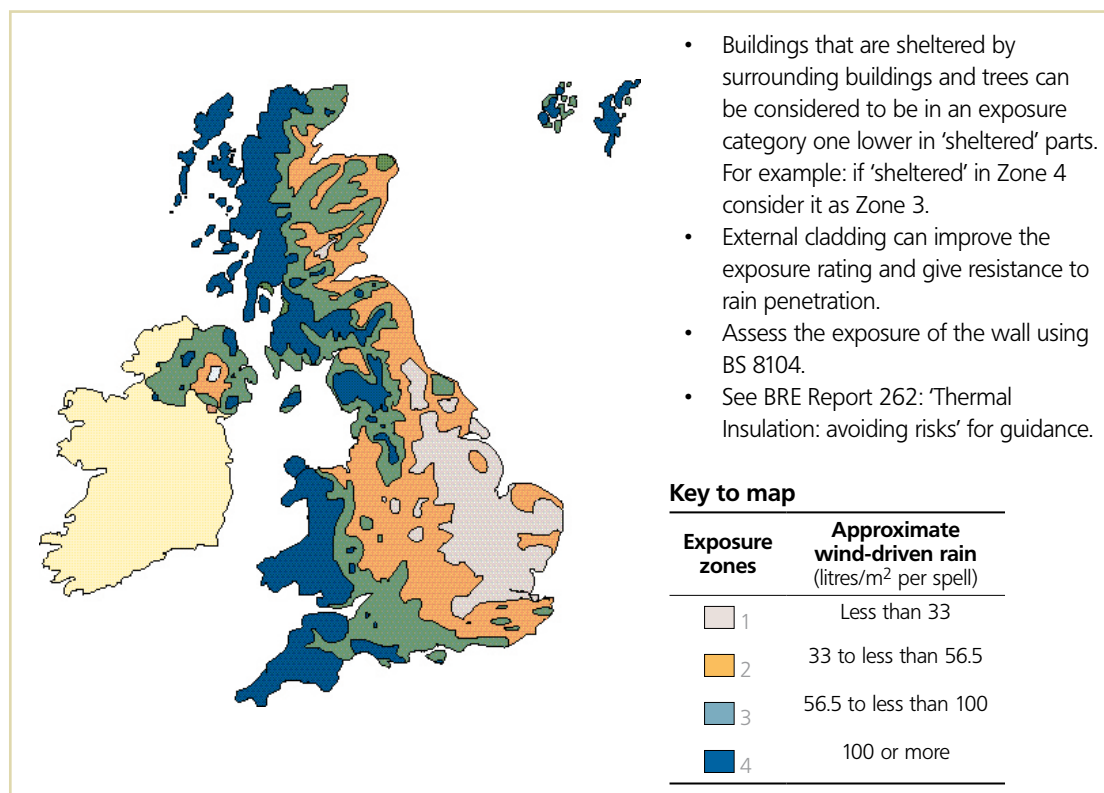


Figure 2 Example of general levels of exposure to wind-driven rain in the UK used for assessing the suitability of walls for cavity wall insulation

Further information

The Energy Saving Trust sets energy efficiency standards that go beyond building regulations for use in the design, construction and refurbishment of homes. These standards provide an integrated package of measures covering fabric, ventilation, heating, lighting and hot water systems for all aspects of new build and renovation. Free resources including best practice guides, training seminars, technical advice and online tools, are available to help meet these standards.

The following publications may also be of interest:

Cavity wall insulation in existing housing (CE16/GPG26)

Domestic Energy Efficiency Primer (CE101/GPG171)

To obtain these publications or for more information, call 0845 120 7799, email bestpractice@est.org.uk or visit www.est.org.uk/housingbuildings

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